

## The Invention Is Claimed To Be:

1. A radiation detector made from a compound comprising:  $\text{Cd}_x\text{Zn}_{1-x}\text{Te}$ , where  $0 \leq x \leq 1$ ; Pb in a concentration between 10 and 10,000 atomic parts per billion; and at least one element selected from the group consisting of (i) Cl and (ii) elements in column III of the periodic table in a concentration between 10 and 10,000 atomic parts per billion.
2. The radiation detector as set forth in claim 1, wherein the compound further includes at least one element selected from the group consisting of V, Ti, Ni, Sn and Ge in a concentration between 10 and 10,000 atomic parts per billion.
3. A method of forming a radiation detector compound comprising:
  - (a) providing a mixture of Cd, Zn and Te;
  - (b) heating the mixture to a liquid state;
  - (c) adding to the liquid mixture a first dopant that adds shallow level donors (electrons) to the top of an energy band gap of said mixture when it is solidified;
  - (d) adding to the liquid mixture a second dopant that adds deep level donors and/or acceptors to the middle of said band gap of said mixture when it is solidified; and
  - (e) solidifying said mixture including said first and second dopants to form the compound.
4. The method of claim 3, wherein the first dopant is at least one element from column III and/or column VII of the periodic table.
5. The method of claim 4, wherein the first dopant is at least one element selected from the group consisting of B, Al, Ga, In, Tl and Cl.
6. The method of claim 3, wherein a concentration of the first dopant in the compound is between 10 and 10,000 atomic parts per billion.
7. The method of claim 3, wherein the second dopant is Pb.
8. The method of claim 3, wherein a concentration of the second dopant in the compound is between 10 and 10,000 atomic parts per billion.

9. The method of claim 3, further including:  
adding to the mixture a third dopant that adds deep level donors and/or acceptors to the middle of said band gap of said mixture when it is solidified.
10. The method of claim 9, wherein a concentration of the third dopant in the compound is between 10 and 10,000 atomic parts per billion.
11. The method of claim 9, wherein the third dopant is at least one element selected from the group consisting of V, Ti, Ni, Sn and Ge.